



# Oregon

Theodore R. Kulongoski, Governor

File  
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January 16, 2007

Paul Mayer  
Waterfront Pearl Limited Partnership  
1111 W Hastings St, Ste 200  
Vancouver, BC V6E 2J3  
CANADA

RE: **No Further Action Determination**  
Waterfront Pearl Development  
Tax Lots 1N1E34BB 0300 & 0400  
ECSI Site #4535

Dear Mr. Mayer

The Oregon Department of Environmental Quality (DEQ) has completed a review of several documents submitted to DEQ by EVREN Northwest (ENW) on your behalf. The property consists of tax lot(s) 1N1E34BB 0300 and 0400 - see the attached DEQ Staff Report and site map. The work described in the reports was reviewed under terms of a Voluntary Cleanup Agreement dated January 17, 2006 and signed by you on January 25, 2006.

DEQ has determined that no further action is required to address environmental contamination at the Waterfront Pearl Development site. A summary of DEQ's findings are summarized in the attached Staff Report. This determination is based on the regulations and facts as we now understand them, including but not limited to the following:

The Oregon Department of Environmental Quality (DEQ) reviewed the available site investigation and remedial action reports for the property located just southeast of the intersection of NW 9th and NW Naito Parkway in Portland, Oregon. The DEQ reviewed the reports for the site and summarized its findings in a Staff Report dated November 7, 2006. The Staff Report recommended no further action (NFA) for the property.

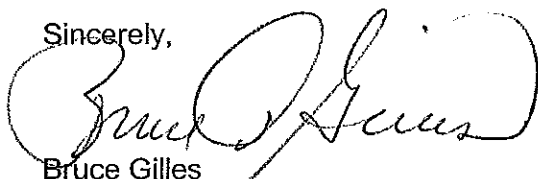
Approximately 74,000 metric-tons of contaminated soil was removed from the site between November of 2005 through April of 2006. Confirmation soil sampling along the bottom and sides of the excavation and a site-specific risk evaluation has demonstrated that residual contamination of petroleum hydrocarbons and metals are below cleanup levels developed for Excavation Worker and residential exposure standards. The surrounding area is zoned for a mix of residential, industrial and commercial uses and the only beneficial use of groundwater is for recharge to the Willamette River. Ecological risks to aquatic species in the Willamette River were evaluated by comparing surface soil concentrations for several metals and polynuclear

aromatic hydrocarbons (PAHs) to Probable Effects Concentrations (PECs) developed for DEQ's Portland Harbor Joint Source Control Strategy screening values. Based on this analysis, that no soil concentrations exceeded PECs, DEQ has concluded that there was no threat to ecological species from the site.

DEQ provided a public comment period from December 1, 2006 to January 2, 2007, to announce the proposed NFA determination. No comments were received by DEQ. Based on our review of available site information, no further action is required at this site under the Oregon Environmental Cleanup law, ORS 465.200 et. seq., unless additional information becomes available that warrants further investigation.

We will update the Environmental Cleanup Site Information System (ECSI) database to reflect this decision. If you have any questions about this letter, please contact Chuck Harman at 503-229-5585.

Sincerely,

A handwritten signature in black ink, appearing to read "Bruce Gilles", written over a circular scribble.

Bruce Gilles  
Environmental Cleanup Program  
Northwest Region

Encl: DEQ Staff Report – Waterfront Pearl Development, ECSI #4535, Portland, Oregon

cc: Lynn Green, Evren Northwest, Inc.  
Robert Williams, DEQ NWR Cleanup Coordinator  
ECSI file #4535

**STAFF REPORT**  
**WATERFRONT PEARL DEVELOPMENT**  
**ECSI #4535**  
**PORTLAND, OREGON**

## **1.0 INTRODUCTION AND PURPOSE**

This document presents the Oregon Department of Environmental Quality (DEQ) proposed remedial action at the Waterfront Pearl Development site located in Portland, Oregon. The remedial action was chosen in accordance with Oregon Revised Statute (ORS) 465.200 etc. seq. and is based on the administrative record for this site. This staff report summarizes the more detailed information presented in the soil and groundwater remedial investigation reports and other documents in the administrative record.

The Waterfront Pearl Limited Partnership, the owner of the site, signed a Letter Agreement with the Oregon Department of Environmental Quality (DEQ) on January 25, 2006 requesting oversight of environmental work being performed at the site. Previous to signing with DEQ, hazardous substances had been detected in site soil.

The remedial action evaluated in this report applies to contamination in site soil and groundwater.

## **2.0 SUMMARY OF PROPOSED REMEDIAL ACTION**

Proposed remedial action objectives for soil and groundwater are:

- Removal of historic fill from the site, down to native material;
- No additional action in riverbank area;

A more detailed description of proposed actions for soil and groundwater can be found in Section 7: Proposed Remedial Action.

## **3.0 SITE DESCRIPTION**

The Waterfront Pearl Development site is an approximately 2.4-acre property located along Naito Parkway, in northwest downtown Portland, (Multnomah County), Oregon. The site has been undergoing redevelopment and there is no current site address. Located in a former heavy industrial area of Portland which is also undergoing redevelopment into commercial and residential development, the property is bounded on the east by the Willamette River; the west by NW Naito Parkway; the south by a parking lot and existing commercial redevelopment (Albers Mill Building) and the north by the Portland Mounted Police horse barn.

The site is constituted of two tax lots - 1N1E34BB 0300 (1.84 acres) and 0400 (0.56 acres). The location of the site is shown in Attachment 1.

The area is zoned as "Central Employment", which is defined by the City of Portland as –

"This zone implements the Central Employment map designation of the Comprehensive Plan. The zone allows mixed-uses and is intended for areas in the center of the City that have predominantly industrial type development. The intent of the zone is to allow industrial, business, and service uses which need a central location. Residential uses are allowed, but are not intended to predominate or set development standards for other uses in the area. The development standards are intended to allow new development which is similar in character to existing development."

The formerly flat site has been undergoing redevelopment since the Winter of 2006. Approximately 73,823 metric-tons of soil, primarily composed of historic fill material, have been removed from the site, creating a 20-30 feet deep excavation between NW Naito Parkway and the western shore of the Willamette River. The site development plan is to create a condominium style residential facility with subsurface parking. The site is currently fenced during site development. The prior use for the site was as an uncovered parking lot. Historic use of the site was for warehouse space and docks for a variety of businesses dating back to the 1920s.

Sanborn Fire Insurance maps dated April 1924 identify the building as "Interstate Terminals (Lessee) Albers Dock No. 3". A consulting company working for the site developer reviewed available aerial photographs that indicated that the warehouse structures were demolished around 1966. From about 1966 to 1998, the River Queen, a ship with a restaurant and other entertainment was moored from the adjoining property just to the south of the subject site. The southern edge of the site was partially filled with the concrete bows of old ships and a small memorial park was located on this property until recently.

Native soil at the site is primarily sandy silts and silty sands, interbedded with fine grain sands. The fill material found on the site was primarily loose sands with organics, metal, brick and large wood piling debris. Elevated concentrations of petroleum hydrocarbons and several metals (lead, mercury, chromium and zinc) were measured in the site's fill material.

A Beneficial Use Survey completed for the site determined that there is no current or reasonably likely future use of shallow groundwater other than recharge to the River. The reasonable likely future use of the property and immediate surrounding area is mixed commercial, residential and industrial.

## **4.0 SITE INVESTIGATION**

### **4.1 Previously Reviewed Reports:**

This site originally came to DEQ's attention in October of 2005, when complaints describing the placement of fill materials on a property in Columbia County were received. The fill material, which was described as gray-colored, odorous soil with debris was coming from the excavation at the Waterfront Pearl Development site. DEQ investigated the complaint and verified the source of the fill material. After this discovery, several site assessments, geotechnical and fill material reports were produced for DEQ's review.

During original site development planning, both the subject tax lots and the south-adjacent tax lot were slated for development simultaneously and some site evaluations and investigations addressed all three

tax lots. However, at some point in the development planning process, the south-adjacent lot (1N1E34BA 0100) was separated out from the development plans.

DEQ staff reviewed reports, listed in Appendix A, which described the history and assessment of the three contiguous tax lots. These reports described the site's early use as a riverside warehouse, primarily for food and grain storage, followed by demolition of the building and eventual use of the site for parking and the small Liberty Ship park. The assessment work found that petroleum hydrocarbons, polynuclear aromatic hydrocarbons (PAHs), and metals were present in site soils, primarily due to contaminated fill placed on the site after the warehouse structures were demolished.

Based on DEQ's review of the reports, the site was recommended for screening in November of 2005.

#### 4.2 Remedial Decision Reports and Supporting Analysis

In May of 2006, EVREN Northwest, Inc. provided DEQ with two additional reports for review under a Voluntary Cleanup Program (VCP) letter agreement. These reports were submitted to demonstrate that no additional investigation or remedial action was needed at the site.

Technical Memorandum: Confirmation Soil Sampling, Waterfront Pearl Development, 1300 NW Naito Parkway, Portland, Oregon; EVREN Northwest, Inc.; April 23, 2006. This report summarized the site confirmation soil sampling that had been performed between October of 2005 and January of 2006. Confirmation samples were acquired along the bottom and sides of the excavation to determine if residual soils contained concentrations of site-related contaminants that posed a threat to human health or the environment.

Risk Assessment, Waterfront Pearl Development, 1300 NW Naito Parkway, Portland, Oregon; EVREN Northwest, Inc.; May 1, 2006. This report summarized the findings of a Human Health Risk Assessment (HHRA) and an Ecological Risk Assessment (ERA) for the site. Exposure point concentrations for site contaminants of interest (PAHs) were calculated and a quantitative risk calculation was performed to determine the risk to future urban residential dwellers on the site.

The ecological risk assessment went through a scoping step which concluded that there was no complete pathway from the site to the Willamette River.

A list of the reports and information reviewed for this staff report is provided in Appendix B.

### **5.0 REMEDIAL INVESTIGATION AND RISK ASSESSMENT SUMMARY**

#### 5.1 Remedial Investigation

The soil confirmation sampling from the excavation bottom and sides, which was performed in March and April of 2006 after site excavation was completed, constituted the remedial investigation for the site. The confirmation samples were composited samples where three individual samples were taken from pre-selected grid cells throughout the two tax lots – see Attachment 2. The results from that sampling were summarized in the April 2006 Technical Memorandum introduced above and are shown as Attachments 3 and 4. A total of 19 composited soil samples were collected and tested in the laboratory. The sample

concentration results were utilized in the HHRA to calculate exposure point concentrations for numerous PAHs, and the metals lead, mercury and zinc.

Confirmation samples from the bottom and sides of the excavation detected several PAHs. The highest soil concentrations were found for benzo(a)pyrene, which had detections that ranged from non-detect (<0.005) to 0.68 ppm. Several benzo(a)pyrene concentrations exceeded the EPA Region 9 PRG for a residential setting of 0.062 ppm. (See Attachment 3).

## 5.2 Risk Assessment

In May 2006, DEQ received the HHRA and ERA completed by EVREN Northwest, Inc. for the Waterfront Pearl Limited Partnership.

### *Human Health Risk Assessment*

The potential risks posed to human health were based upon quantitative risk calculations for benzo(a)pyrene and dibenz(a,h)anthracene as contaminants of potential concern (COPCs) for the site. A Conceptual Site Model analysis determined that complete exposure pathways existed for future residents, future construction and excavation workers. The risk analysis found that there were no unacceptable risks to those receptors:

- Onsite excavation worker exposure to site soil through incidental ingestion, dermal contact and inhalation;
- Residents in a residential scenario to volatilization from soil to outdoor or indoor air.

Groundwater exposure scenarios were not evaluated based on the Beneficial Use survey which concluded that the most likely beneficial use of groundwater in the area around the site was recharge to the Willamette River. In addition, since fill materials and soils had been excavated from the site and a subsurface garage would be established, there would be no impact to site groundwater.

In a letter dated June 29, 2006 DEQ provided feedback addressing the Risk Assessment report. In that letter DEQ concurred with the findings of the Human Health Risk Assessment, that the site no longer posed an unacceptable risk to human health.

### *Ecological Risk Assessment*

The Ecological Risk Assessment (ERA), presented in the May 1, 2006 Risk Assessment report, concluded at the scoping stage that no exposure to ecological species would occur within the locality of the facility (LOF). This conclusion was based on judgment that (1) site groundwater would not transport the relatively immobile COPCs (PAHs) to the Willamette River to aquatic receptors; and that (2) the site development would primarily be large residential structures that would not provide habitat for terrestrial or aquatic species.

In the June 29, 2006 letter DEQ also requested additional analysis to address what we felt was an incomplete evaluation of possible ecological risks from the historic fill material along the eastern side of the site along the Willamette River.

DEQ's main concern was that the May 2006 Ecological Risk Assessment had not considered that the historic fill material that remains in place along the banks of the Willamette River was a potential exposure source to aquatic invertebrates. In the June 29, 2006 letter DEQ compared laboratory measured concentrations of polynuclear aromatic hydrocarbons (PAHs) and lead measured in the site fill materials to DEQ risk-based sediment screening level values (SLVs) and estimated that fill material at similar concentrations along the river would present an unacceptable risk to aquatic invertebrates.

EVREN Northwest, Inc. (ENW), in a correspondence dated September 13, 2006, responded to DEQ's June 29 feedback by presenting the following:

- (a) They did not agree that the Locality of the Facility (LOF) for the site extended to the Willamette River since the fill material at the site was present above the typical level of the river. ENW advocated that benthic organisms that exist below the typical river level adjacent to the site could not be exposed to contaminants in the fill material.
- (b) Further, that much of the riverbank is covered with decades-old riprap and is therefore inaccessible to aquatic receptors even during periods of high water level events. Additionally, potentially accessible areas of soil or fill material within the riprap adjacent to the site would largely be covered by river sediment that had been more recently deposited since the riprap was placed along the banks of the Willamette River.
- (c) It was ENW's judgement that the most likely possible contaminant pathway to the Willamette River would be from surface soil erosion runoff into the river from locations along the eastern edge of the site. They argued that via this process, any contaminants in the soil would be diluted by the much larger volume of sediment present in the river. They proposed that, given this pathway scenario, the most appropriate screening concentrations for site-related contaminants of interest were the Probable Effects Concentrations (PECs) from DEQ's Portland Harbor Joint Source Control Strategy, Soil/Catch Basin Sediment SLVs for Toxicity (December 2005).
- (d) To evaluate the surface soil runoff into the Willamette River pathway, ENW collected two soil samples from the landward slope of the eastern berm. The two soil samples, taken from 2 feet below the surface of the top of the berm, were analyzed for PAHs, lead, mercury and zinc. The sample results were compared to the PECs and were either non-detects or below the PECs (see Attachments 5 and 6 for comparison tables).

## **6.0 FEASIBILITY STUDY/EVALUATION OF REMEDIAL ALTERNATIVES**

A Feasibility Study was not required for this project. The excavation and disposal of the 73,823 metric-tons of former site fill materials and soils, in effect, constituted a removal action and likely removed any soils that may have been contaminated at levels that posed a threat to human health or the environment.

The HHRA and ERA established that remaining soils did not pose an unacceptable risk to human health or the environment.

## **7.0 PROPOSED REMEDIAL ACTION**

Based upon the conclusions reached from the Human Health Risk Assessment and the response to DEQ's concerns regarding the Ecological Risk Assessment, DEQ has concluded that the Waterfront Pearl Development site does not pose an unacceptable risk to human health or the environment. Therefore, no further investigative or remedial action is required.

## **8.0 PEER REVIEW SUMMARY**

A peer review team consisting of technical staff from DEQ's Cleanup & Emergency Response section in the Northwest Region was convened for this project. The project team included a staff environmental specialist and section manager. They reviewed and commented on all significant project reviews.



APPENDIX A  
ADMINISTRATIVE RECORD INDEX

Phase I Environmental Site Assessment, River Queen Redevelopment Project, 1300 NW Naito Parkway, Portland, Oregon; GRI Geotechnical & Environmental Consultants, February 5, 2003.

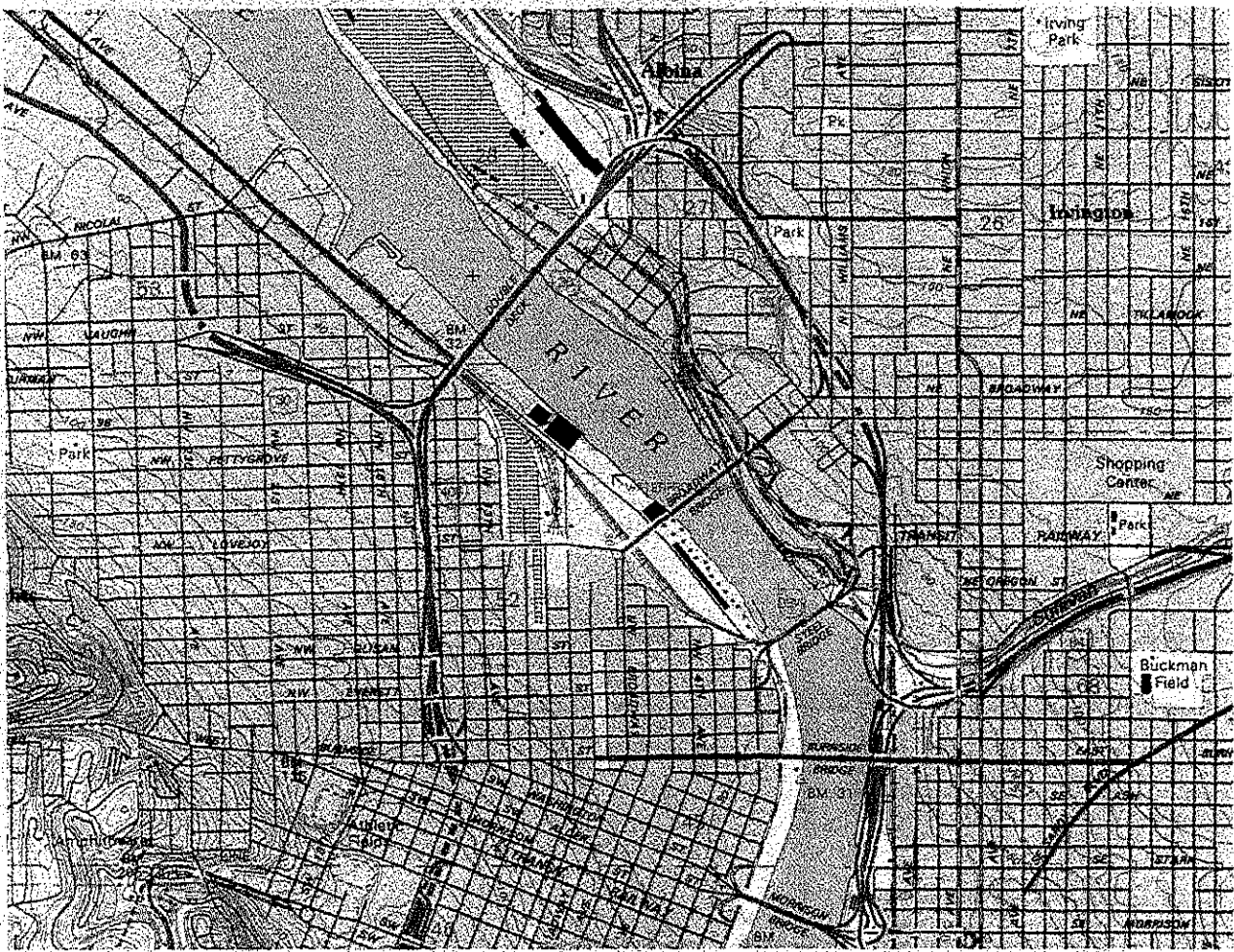
Phase II Environmental Site Assessment, River Queen Project, 1300 NW Naito Parkway, Portland, Oregon; GRI Geotechnical & Environmental Consultants, August 12, 2004.

Geotechnical Investigation, Waterfront Pearl Project, NW Naito Parkway, Portland, Oregon; GRI Geotechnical & Environmental Consultants, February 24, 2005.

Responses to Site Development Checklist, Waterfront Pearl Project, Application No. 05-1111751-EXC-01-CO; GRI Geotechnical & Environmental Consultants, May 20, 2005.

Technical Memorandum: Scappoose Fill Sites Soil Removal, Waterfront Pearl Condominium Project; EVREN Northwest, Inc.; March 14, 2006.

DEQ Voluntary Cleanup Program (NWR) files



Source: USGS Topographic Map, 7.5-Minute Portland Quadrangle, 1990



Date Drawn: 4/24/2006  
CAD File Name: 271-05002-01\_svmmap.doc  
Drawn By: LDG  
Approved By: NMW

Waterfront Pearl Development  
1300 NW Naito Parkway  
Portland, Oregon

### Site Vicinity Map

Project No.  
271-05002-01  
Figure No.  
1

## Attachment 2 – Site confirmation sampling grid



Table 3. Summary of Analytical Results for Confirmation Soil Samples, PAHs

Sample Site	Sample ID	Depth	Location	Date	Polyaromatic Hydrocarbons													
					Acenaphthene	Anthracene	Benzo[a]anthracene	Benzo[a]fluoranthene	Benzo[b]fluoranthene	Benzo[k]fluoranthene	Fluorene	Glyoxal	Indeno[1,2,3-cd]pyrene	Naphthalene	Phenanthrene	Pyrene	Benzo[e]pyrene	Benzo[a]pyrene
		(feet)			(mg/Kg)	Confirmation (both Tax Lots)												
CGC1	GCG1-comp	20	Southeastern portion of Tax Lot 400	3/14/2006	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
CGC2	GCG2-comp	20	Eastern portion of Tax Lot 400	3/14/2006	<0.050	<0.050	0.14	0.19	0.069	0.18	0.18	<0.050	0.27	<0.050	0.11	<0.050	0.34	
CGC3	GCG3-comp	20	Southeastern portion of Tax Lot 300	3/14/2006	<0.050	<0.050	0.26	0.34	0.1	0.28	0.29	<0.050	0.44	<0.050	0.17	<0.050	0.44	
CGC4	CG4-comp	20	Eastern portion of Tax Lot 300	3/27/2006	<0.050	0.054	0.21	0.28	0.083	0.23	0.23	<0.050	0.44	<0.050	0.13	<0.050	0.44	
CGC5	GCG5-comp	20	Eastern portion of Tax Lot 300	3/14/2006	<0.050	<0.050	<0.050	0.061	<0.050	0.054	0.058	<0.050	0.11	<0.050	<0.050	<0.050	0.11	
CGC6	GCG6-comp	20	Northeastern portion of Tax Lot 300	3/14/2006	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.056	
CGC7	GCG7-comp	20	Eastern portion of Tax Lot 300	3/14/2006	<0.050	<0.050	0.14	0.18	0.057	0.19	0.2	<0.050	0.23	<0.050	0.11	<0.050	0.32	
CGC8	GCG8-comp	20	Eastern portion of Tax Lot 300	3/14/2006	<0.050	<0.050	0.071	0.089	<0.050	0.088	0.06	<0.050	0.12	<0.050	<0.050	<0.050	0.17	
CGC9	GCG9-comp	20	Northern portion of Tax Lot 300	3/14/2006	0.092	<0.050	0.43	0.67	0.22	0.68	0.58	0.075	1.4	<0.050	0.34	<0.050	1.7	
CGC10	GCG10-comp	20	Northwestern portion of Tax Lot 300	3/14/2006	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
CGC11	GCG11-comp	20	Northwestern portion of Tax Lot 300	3/14/2006	<0.050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
CGC12	CG12-comp	15-20	Southeastern portion of Tax Lot 400	3/27/2006	<0.050	<0.005	0.086	0.11	<0.005	0.11	0.099	<0.005	0.19	<0.005	0.086	<0.005	0.21	
CGC13	CG13-comp	15-20	Southern portion of Tax Lot 400	3/27/2006	<0.005	<0.005	<0.005	0.052	<0.005	<0.005	<0.005	<0.005	0.091	<0.005	<0.005	<0.005	0.085	
CGC14	CG14-comp	10-20	Southern portion of Tax Lot 400	3/27/2006	<0.005	<0.005	0.013	0.017	0.0055	0.013	0.014	<0.005	0.022	<0.005	0.0089	<0.005	0.025	
CGC15	CG15-comp	20	Western corner of Tax Lot 400 and Southern corner of Tax Lot 300	3/27/2006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
CGC16	CG16-comp	20	Western portion of Tax Lot 400	3/27/2006	<0.005	<0.005	0.051	0.059	<0.005	0.062	0.057	<0.005	0.081	<0.005	<0.005	<0.005	0.097	
CGC17	CG17-comp	20	Western portion of Tax Lot 400	3/27/2006	<0.050	<0.050	0.16	0.18	0.077	0.17	0.18	<0.050	0.24	<0.050	0.09	<0.050	0.28	
CGC18	CGC18-comp	20	Eastern portion of Tax Lot 300	4/4/2006	<0.005	0.0054	0.036	0.058	0.016	0.046	0.041	0.0073	0.058	<0.005	0.027	<0.005	0.057	
CGC19	CGC18-comp	20	Southeastern portion of Tax Lot 300	4/4/2006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	
EPA Region IX Screening-Level PRGs (Residential)					3,700	22,000	0.62	0.62	6.2	0.062	62	0.062	2,300	2,700	0.62	56	2,300	

**Notes:**

mg/kg = milligrams per kilogram.

<sup>1</sup> EPA Region IX Preliminary Remediation Goals for residential sites.

Bolded values exceed screening criteria, as indicated.

# Attachment 4 – Confirmation Sampling Table for Metals

**Table 4. Summary of Analytical Results for Confirmation Soil Samples, Total Metals**

Sample Site	Sample ID	Depth	Location	Date	Total Metals		
					Lead	Mercury	Ni
		(feet)			(mg/kg)		
CGC1	GCG1-comp	20	Southeastern portion of Tax Lot 400	3/14/2006	33.3	0.28	54.9
CGC2	GCG2-comp	20	Eastern portion of Tax Lot 400	3/14/2006	111	0.28	107
CGC3	GCG3-comp	20	Southeastern portion of Tax Lot 300	3/14/2006	55.5	<0.2	86.1
CGC4	GCG4-comp	20	Eastern portion of Tax Lot 300	3/27/2006	93	0.32	83.8
CGC5	GCG5-comp	20		3/14/2006	197	0.35	150
CGC6	GCG6-comp	20	Northeastern portion of Tax Lot 300	3/14/2006	64.1	<0.2	71.3
CGC7	GCG7-comp	20		3/14/2006	42.7	<0.2	55
CGC8	GCG8-comp	20		3/14/2006	30.2	<0.2	48.3
CGC9	GCG9-comp	20	Northern portion of Tax Lot 300	3/14/2006	42.3	0.54	59.4
CGC10	GCG10-comp	20		3/14/2006	2.7	<0.2	25.8
CGC11	GCG11-comp	20	Northwestern portion of Tax Lot 300	3/14/2006	3.49	<0.2	32.9
CGC12	CG12-comp	15-20	Southeastern portion of Tax Lot 400	3/27/2006	74.7	<0.2	85.8
CGC13	CG13-comp	15-20	Southern portion of Tax Lot 400	3/27/2006	29.9	<0.2	48.1
CGC14	CG14-comp	10-20		3/27/2006	11.1	<0.2	35.9
CGC15	CG15-comp	20	Western corner of Tax Lot 400 and Southern corner of Tax Lot 300	3/27/2006	4.15	<0.2	28.7
CGC16	CG16-comp	20	Straddling the center of the boundary line between Tax Lots 300 and 400	3/27/2006	13.9	<0.2	36.7
CGC17	CG17-comp	20		3/27/2006	40	<0.2	43.4
CGC18	CGC18-comp	20	Central southern portion of Tax Lot 300	4/4/2006	7.01	<0.2	28.8
CGC19	CGC19-comp	20	Southern corner of Tax Lot 300	4/4/2006	2.08	<0.2	22.9
EPA Region IX Screening-Level PRGs <sup>1</sup> (Residential)					400	23	23,000
Background Concentration <sup>2</sup>					17	0.07	86

**Notes**

mg/Kg = milligrams per kilogram.

<sup>1</sup> EPA Region IX Preliminary Remediation Goals for residential sites.

<sup>2</sup> Background concentrations from ODEQ memo dated October 28, 2002, from Toxicology Workgroup to ODEQ.

Table 1. Summary of Analytical Results for Berm Soil Samples, PAHs

Sample Site	Sample ID	Depth (feet)	Location	Date	Polyaromatic Hydrocarbons												
					Acenaphthene	Anthracene	Benz[a]anthracene	Benz[b]fluoranthene	Benz[k]fluoranthene	Benz[a]pyrene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-cd]pyrene	Naphthalene	Pyrene
					(mg/Kg)												
Berm Assessment																	
BURM01	BURM01-80-060815	1	80-ft south of northern property boundary	8/15/2006	<0.05	<0.05	<0.05	0.081	<0.05	0.058	0.067	<0.05	0.086	<0.05	<0.05	<0.05	0.086
BURM02	BURM02-180-060815	1	180-ft south of northern property boundary	8/15/2006	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.062	<0.05	<0.05	<0.05	0.065
Freshwater Sediment Probable Effects Concentrations for Benthic Invertebrates					0.089	0.845	1.050	1.450	0.300	13.400	1.290	0.135	2.230	0.536	3.200	0.561	1.520
EPA Region IX Screening-Level PRGs <sup>1</sup> (Residential)					3,700	22,000	0.62	0.62	6.2	0.062	62	0.062	2,300	2,700	0.62	56	2,300

**Notes**

mg/Kg = milligrams per kilogram.

<sup>1</sup> EPA Region IX Preliminary Remediation Goals for residential sites.

Bolded values exceed screening criteria, as indicated.



Attachment 6 – Berm samples comparison to PECs (Metals).

Table 2. Summary of Analytical Results for Berm Soil Samples, Total Metals

Sample Site	Sample ID	Depth	Location	Date	Total Metals		
		Lead			Mercury	Zinc	
		(feet)			(mg/Kg)		
Berm Assessment							
BURM01	BURM01-80-060815	1	80-ft south of northern property boundary	8/15/2006	128	<0.2	108
BURM02	BURM02-180-060815	1	180-ft south of northern property boundary	8/15/2006	47.4	<0.2	71.3
Freshwater Sediment Probable Effects Concentrations for Benthic Invertebrates					128	1.1	460
EPA Region IX Screening-Level PRGs <sup>1</sup> (Residential)					400	23	23,000
Background Concentration <sup>2</sup>					17	0.07	86

Notes

mg/Kg = milligrams per kilogram.

<sup>1</sup> EPA Region IX Preliminary Remediation Goals for residential sites.

<sup>2</sup> Background concentrations from ODEQ memo dated October 28, 2002, from Toxicology Workgroup to ODEQ

